

Perceptions of Community Nutrition and Health Needs in the Lower Mississippi Delta: A Key Informant Approach

KATHLEEN YADRIK,¹ JACQUELINE HORTON,² JANICE STUFF,³ BERNESTINE MCGEE,⁴
MARGARET BOGLE,⁵ LEROY DAVIS,⁶ IVIS FORRESTER,⁶ EARLINE STRICKLAND,⁶
PATRICK H. CASEY,⁷ DONNA RYAN,⁸ CATHERINE CHAMPAGNE,⁸ KIRKLAND MELLAD,⁴
EDITH NEAL,⁹ AND SAHAR ZAGHLOUL⁹ FOR THE LOWER MISSISSIPPI DELTA NUTRITION
INTERVENTION RESEARCH INITIATIVE CONSORTIUM

¹School of Family and Consumer Sciences, The University of Southern Mississippi, Hattiesburg, Mississippi 39406-5054;
²Coordinating Center, Westat, Rockville, Maryland 20850; ³U.S. Department of Agriculture, Agricultural Research Service,
Children's Nutrition Research Center, Houston, Texas 77030; ⁴Department of Human Nutrition and Food and College
of Agricultural, Family and Consumer Sciences, Baton Rouge, Louisiana 70813; ⁵U.S. Department of Agriculture,
Agricultural Research Service, Little Rock, Arkansas 72211; ⁶School of Agriculture, Research, Extension and Applied
Sciences, and Department of Family and Consumer Sciences, Alcorn State University, Alcorn State, Mississippi
39096-7500; ⁷Arkansas Children's Hospital Research Institute, Little Rock, Arkansas 72202-3591; ⁸Pennington Biomedical
Research Center, Baton Rouge, Louisiana 70808-4124; Department of Human Sciences, University of Arkansas at
Pine Bluff, Pine Bluff, Arkansas 71611

ABSTRACT

Objective: Key informants' perceptions of nutrition and health needs in their southern rural communities were assessed prior to nutrition intervention planning.

Design: This cross-sectional survey used in-person interviews.

Subjects/Settings: A sample of 490 individuals from 12 professional and lay roles in 8 community sectors in 36 counties in Arkansas, Louisiana, and Mississippi was chosen.

Statistical Analyses Performed: Factor analysis was carried out on reported food, nutrition, and health problems and contributing factors. The General Linear Models procedure identified within- and between-subject effects for factors. Tukey's post hoc tests identified differences between sectors and states. Frequencies and weighted rankings were computed for health problems.

Results: Key informants rated individual-level factors (food choices, education, willingness to change, health behavior) as more important than community-level factors (food and health care access, resources) with regard to nutrition and health problems and contributors to problems. The number one health problem was hypertension.

Implications: Key informants are knowledgeable about nutrition and health problems, contributing factors, and available resources. Individual factors were perceived as more important contributors to nutrition and health problems providing valuable information for planning nutrition interventions.

KEY WORDS: community, nutrition assessment, health assessment, key informant, interviews, race, rural

(JNE 33:266-277, 2001)

This study was funded by the U.S. Department of Agriculture, Agricultural Research Service, Project No. 6251-53000-002-00-D.

Address for correspondence: Kathleen Yadrick, Ph.D., R.D., School of Family and Consumer Sciences, Box 5054, University of Southern Mississippi, 2609 West 4th Street, Room HE 214, Hattiesburg, MS 39406-5054; Tel: (601) 266-4479; Fax: (601) 266-6343; E-mail: m.yadrick@usm.edu.

©2001 SOCIETY FOR NUTRITION EDUCATION

INTRODUCTION

The importance of involving knowledgeable members of the community in identifying nutrition and health problems and the resources available to provide solutions to the problems is well recognized.¹⁻³ This approach is particularly important

in rural areas where smaller community size may lead to the false assumption that communities are homogeneous; therefore, less preparation is needed before nutrition and health interventions are initiated.⁴ The Lower Mississippi Delta (LMD) region of Arkansas, Louisiana, and Mississippi is a predominantly rural traditionally agricultural area with high rates of nutritional deficits and chronic disease mortality and morbidity.⁵⁻⁹ These three states were recently ranked among the poorest in the nation with respect to the health of the population.¹⁰ Educational attainment is well below the national average,¹¹ and the proportion of households with incomes below the federal poverty level ranges from 16 to 22%.^{6,12} In response to the nutrition-related health problems in this region, the U.S. Congress directed the U.S. Department of Agriculture, Agricultural Research Service, to establish the Lower Mississippi Delta Nutrition Intervention Research Initiative (Delta NRI). Six academic institutions in the three states are collaborating to design, implement, and evaluate sustainable nutrition interventions to improve health in the LMD.

Although data for the Delta region are sparse, inferences from data collected from the southern region of the United States or from each state suggest that rates of hypertension, obesity, and diabetes are higher than those nationwide.¹³ Theoretically, it would be possible to design nutrition interventions solely on the basis of vital statistics, background literature, and relevant quantitative data. On the other hand, for a community-based intervention to be effective and sustainable, perceptions of community members must be determined and then used to plan and tailor interventions. The purpose of this study was to examine perceptions of community key informants regarding nutrition and health problems, contributors to problems, and resources in their LMD counties. Key informants were individuals who by virtue of their role or position have knowledge of and access to the community.^{14,15} Since nutrition monitoring data for the LMD are sparse and because of the diversity in key informants' roles and viewpoints, it was assumed that they would have varying perceptions about food and nutrition problems and contributors to problems in their counties. Based on existing literature on disease prevalence in the region, it was also assumed that key informants would report hypertension, obesity, and diabetes as among the most important health problems in their counties. Because of the many similarities in health statistics and sociodemographic characteristics across the three states, it was assumed that key informants from different states would have similar perceptions of problems.

METHODS

The key informant approach, modeled after rapid assessment procedures, has been demonstrated to be effective in assessing community needs and providing access to the community prior to implementing interventions.¹⁴⁻¹⁹ This study used a modified key informant approach to conduct in-person

interviews with 490 key informants in 36 selected counties and parishes (hereafter referred to as Delta NRI counties) in the LMD on their perceptions of the nutrition and health problems and resources in their communities.

Questionnaire design and pilot study procedures. A pilot study was conducted in a single county in each state during January and February 1997. Thirty-seven key informants were interviewed. For the pilot, a series of open- and closed-ended questions was developed using existing data on nutrition and health problems and community resources.^{7-9,20-24} The responses given with the greatest frequency in the pilot were used to develop questions and response sets for use in the main study. Both open- and closed-ended questions, pretested for clarity, were included in the main study questionnaire.

The final questionnaire consisted of the following components. First, key informants were asked to provide Likert scale responses to statements about food and nutrition problems and contributors to problems. Key informants were then asked to identify food and nutrition resources that could be found in their county. Next, they were shown a list of 13 common health problems and asked to rank the first, second, and third most important problems in their county. They used Likert scale responses to rate the importance of 12 contributors to health problems in their county. Finally, key informants were provided with a list of health resources and asked to identify those that could be found in their county.

Table 1. Demographic characteristics of the population in the 36 counties in the Lower Mississippi Delta Key Informant Survey, 1997.

| Characteristic | Value |
|---------------------------------|---------|
| Gender ^a | |
| Male | 48.0% |
| Female | 52.0% |
| Race ^a | |
| African American | 51.0% |
| Non-African American | 49.0% |
| Education ^b | |
| Less than high school graduate | 34.8% |
| High school graduate or more | 65.2% |
| Age ^a | |
| 0-14 | 25.3% |
| 15-39 | 36.3% |
| 40-64 | 25.3% |
| 65+ | 13.0% |
| Percent in poverty ^c | 35.5% |
| Total population ^a | 802,843 |

^aSource: U.S. Census, Bureau of the Census, 1996 population estimates program.

^bSmith et al.¹³

^cSource: U.S. Census, Bureau of the Census, 1993 state and county income and poverty estimates.

Table 2. Community sectors and key informant roles.

| <i>Sector^a</i> | <i>Specific Role</i> |
|-------------------------------------|---|
| Health | Primary health care provider |
| | WIC nutritionist |
| Education | School principal |
| | School district director for school lunch and school breakfast programs |
| Government | Cooperative Extension home economist |
| | Mayor |
| Business | Grocery store manager |
| Religion | Minister, African American |
| | Minister, white |
| Voluntary and private organizations | Private community food program director |
| Informal community leadership | Grass-roots community leader, African American |
| | Grass-roots community leader, white |
| Lay representative | Elderly Nutrition Program participant |
| | Nonsupervisory employee of nongovernment employer |

^aSectors are modified from Haglund et al.¹

WIC = Special Supplemental Nutrition Program for Women, Infants and Children.

Selection of key informants. Key informants were selected from each of the 36 Delta NIRI counties. A demographic profile of the counties is found in Table 1. Two counties in Mississippi were treated as a single unit due to their shared resources and small population, yielding 35 sampling units. Key informants in each county were chosen from eight community sectors based on the community assessment model of Haglund et al.¹ Twelve specific community roles were defined within the eight sectors, using the "theory-driven" approach described by Johnson.²⁵ In brief, this approach guides the selection of key informants from a pool of informants classified by theoretical qualifications such as status, role, position, expertise, category, or subgroup membership. Table 2 contains a list of the community sectors and specific roles associated with each sector. In each county, one individual representing each role was interviewed, with the exception of the roles of minister and grass-roots community leader. For these two roles, two individuals were interviewed, one from each of the two predominant racial/ethnic groups in the county.

To identify and then to select specific key informants in each county to interview, lists were generated for each of the 12 community roles from directories and registers of state

and local agencies and organizations, from public sources of information, and by local referral. Specific criteria were used for selection of individuals within each role for interviews. These criteria were intended to ensure representation by race/ethnicity and by geographic distribution within each county. Grass-roots community leaders were selected using the "snowball" technique: those individuals named most frequently by other key informants as informal community leaders were interviewed.

Interviewer training. Interviewers were from the Delta NIRI partner institutions and met uniform selection criteria. Interviewers and field supervisors from each institution participated in a 1½-day training session conducted by the study coordinating center. Training included instruction and practice in interviewing skills and systematic recording of data and responses, as well as a question-by-question review of the interview questionnaire. Field supervisors were trained in monitoring and quality control procedures. Interviewers and field supervisors were certified at training completion.

Study procedures. Following initial contact by telephone and letter, key informants were interviewed at their place of employment or at a community program site. Interviewers transmitted completed questionnaires and report forms to field supervisors, who monitored interviewers using audit forms, reports, and weekly conferences. Following review by field supervisors, questionnaires were transferred to the coordinating center for coding and data entry. The study was conducted in July and August 1997.

Statistics and database management. An SAS database management system maintained by the study coordinating center was used to organize data and perform quality control and data checks.²⁶ Factor analyses and multivariate analyses were completed on responses to questions about food and nutrition problems, contributors to food and nutrition problems, and contributors to health problems, using SPSS version 10.0.²⁷ Items in each of these categories were subjected to separate principal-components factor analyses with varimax rotation. Factors with an eigenvalue greater than 1 were retained. Mean factor ratings were created by averaging the Likert scale ratings for each item loading on a particular factor. The general linear models procedure was conducted to identify within- and between-subject effects for the mean factor ratings in each section. Tukey's post hoc tests were conducted to identify significant differences in mean factor ratings between sectors and states. Differences were considered statistically significant at $p < .05$. A weighted ranking was computed for each health problem by assigning three points to each first choice, two to each second choice, and one to each third choice, summing the points, and dividing by total possible points for the category. Total possible points for the category were calculated by multiplying the number of respondents in the category by six.

Table 3. Mean ratings for food and nutrition problem factors and problems assigned to each factor, key informant survey, Lower Mississippi Delta counties, 1997.

| Factor | Problems | Total (n = 490) | Race/Ethnicity | | Sector | | | | | | | |
|--------------|--|--------------------|-------------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|---------------------|
| | | | AA (n = 200) | CAU (n = 279) | HEAL (n = 70) | GOVT (n = 70) | EDUC (n = 70) | BUS (n = 35) | REL (n = 70) | VOL (n = 35) | ICL (n = 70) | LAY (n = 70) |
| Food access | There is little variety in the types of foods that can be purchased. | 2.98 | 3.17 _a | 2.84 _b | 3.04 _{ab} | 3.05 _{ab} | 2.84 _{bc} | 2.59 _c | 2.98 _{ab} | 3.03 _{ab} | 2.96 _{ab} | 3.19 _a |
| | There are few grocery stores or food markets. | | | | | | | | | | | |
| | Food prices are high. | | | | | | | | | | | |
| | People do not have enough money for food. | | | | | | | | | | | |
| | The school lunch program does not meet the needs of children. | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Food choices | People do not eat fruits and vegetables very often. | 4.10 | 4.15 | 4.07 | 4.40 | 4.15 _a | 4.06 _{ab} | 3.81 _c | 4.03 _{ad} | 4.12 _{ae} | 4.15 _a | 3.95 _{bcd} |
| | People eat a lot of high-fat foods. | | | | | | | | | | | |
| | People eat too much fast food. | | | | | | | | | | | |
| | Women do not eat enough of the right kinds of food when they are pregnant. | | | | | | | | | | | |
| | | | | | | | | | | | | |

Factor ratings are means of ratings for items loading on each factor, using a 5-point scale: 1 = strongly disagree, 5 = strongly agree.

Means in the same row and category (race/ethnicity or sector) with different subscripts differ at $p < .05$.

AA = African American; CAU = Caucasian; HEAL = health; GOVT = government; EDUC = education; BUS = business; REL = religion; VOL = voluntary and private organizations; ICL = informal community leadership; LAY = lay representation.

RESULTS

Sociodemographic characteristics of the sample. A total of 490 key informants were interviewed, 14 from each of the 35 county sampling units. Thirty-five key informants were interviewed from each of two sectors, business and voluntary/private organizations, and 70 from each of the remaining six sectors. Fifty-six percent of the key informants were Caucasian and 41% were African American; 57% were female and 43% were male. Five key informants (1%) were Asian or Hispanic. Race/ethnicity was not recorded for 6 respondents.

Food and nutrition problems, contributors, and resources. For food and nutrition problems, factor analysis yielded two factors, which accounted for 41% of the variance in these items (Table 3). Of the nine food and nutrition problems that were rated by key informants, five problems loaded on factor 1. Factor 1 was characterized by items concerning food availability and cost of food, such as "there are few grocery stores or food markets" and "food prices are high," and was labeled food access. The mean factor rating for food access was 2.98 on a 5-point scale. African Americans rated food access as more important than Caucasians (3.16 vs. 2.84, $p = .0001$). Grocery store managers in the business sector rated it lower in importance than key informants in all other sectors except the education sector (see Table 3). There were no differences in the rating of this factor among the three states.

Four food and nutrition problems loaded on factor 2, labeled food choices and characterized by items such as "people eat a lot of high fat foods" and "people eat too much fast food" (see Table 3). The mean factor rating for food choices was 4.10. Two of four items loading on this factor were rated as somewhat or very important by over 90% of respondents. Key informants in the health sector, who were Special Supplemental Nutrition Program for Women, Infants and Children (WIC) nutritionists and primary care physicians or nurse practitioners, rated this factor as more important than key informants in all other sectors (4.40 vs. 3.95–4.15, $p \leq .01$). There were no differences in ratings for food choices by race/ethnicity or state. Key informants perceived problems labeled as food choices as more important in their counties than those characterized as food access (4.10 vs. 2.97, $p = .0001$).

Key informants rated 10 items on their importance in contributing to food and nutrition problems in their counties. Analysis of these items yielded three factors, which accounted for 52% of the variance (Table 4). Four items loaded on factor 1, labeled education, rated 4.44 on a 5-point scale, and characterized by items such as "lack of nutrition information" and "not knowing how to make dietary changes." Three of four items loading on this factor were rated as somewhat or very important by over 90% of respondents. African Americans rated education as more important in contributing to food and nutrition problems than Caucasians (4.55 vs. 4.35, $p = .0001$). Key informants represent-

ing the business sector rated education of lesser importance than those from all other sectors (4.11 vs. 4.40–4.49, $p \leq .02$), and those in Mississippi rated education as more important than key informants in Arkansas or Louisiana (4.56, 4.33, and 4.38, respectively, $p \leq .01$).

Four items identified as contributors to food and nutrition problems loaded on factor 2, labeled resources, rated 3.76 and characterized by items such as "poverty or low income" and "lack of transportation." African Americans rated resources as more important in contributing to food and nutrition problems than Caucasians (4.04 vs. 3.55, $p = .0001$), and the business sector rated it lower than three other sectors. There were no differences in rating of this factor by state.

Three items loaded on factor 3, labeled willingness to change, rated 4.23. Items under this factor included "unwillingness to make the necessary changes to improve diet and health" and "traditional food preferences or methods of preparation." Two of three items loading on this factor were rated as somewhat or very important by over 90% of respondents. Ratings of this factor were similar for racial/ethnic groups, states, and most sectors, although the health and government sectors rated willingness to change as more important than the business sector ($p \leq .05$). Among the three factors contributing to food and nutrition problems, key informants rated education as most important, followed by willingness to change and finally resources (4.44, 4.23, and 3.76, respectively, $p = .0001$).

Key informants identified resources available in their counties to address food and nutrition problems (Table 5). Food stamps, school lunch, Head Start, WIC, and the Elderly Nutrition Program were identified by 90% or more of key informants.

Health problems, contributors, and resources. From a list of 13 health problems, key informants ranked the top 3 in their counties. Weighted rankings indicated that high blood pressure was perceived as the number one problem by key informants (Fig. 1). Teenage pregnancy, drug addiction, heart disease, and cancer were ranked with high blood pressure among the top five health problems by the majority of respondent groups. However, African Americans ranked diabetes fifth in importance, and respondents from the health sector and the voluntary and private organization sector ranked obesity fourth. There were also some differences in rankings across states. Key informants from Mississippi ranked high blood pressure first, compared to teen pregnancy for Arkansas and cancer for Louisiana. For the entire respondent group, obesity ranked sixth, diabetes ranked seventh, and sexually transmitted diseases and alcoholism tied for eighth. Health problems that were ranked by fewer than 5% of respondents as first, second, or third in importance in their counties included anemia, stroke, prematurity and low birth weight, and infant mortality.

Key informants rated 13 items on their importance in contributing to health problems (Table 6). Two factors accounted for 82% of the variance in the items. The first fac-

Table 4. Mean ratings for food and nutrition problem contributing factors and contributors assigned to each factor, key informant survey, Lower Mississippi Delta counties, 1997.

| Factor | Contributors to Food and Nutrition Problems | Race/Ethnicity | | | Sector | | | | | | | |
|-----------------------|--|--------------------|-------------------|-------------------|--------------------|--------------------|---------------------|-------------------|---------------------|---------------------|--------------------|--------------------|
| | | Total (n = 490) | AA (n = 200) | CAU (n = 279) | HEAL (n = 70) | GOVT (n = 70) | EDUC (n = 70) | BUS (n = 35) | REL (n = 70) | VOL (n = 35) | ICL (n = 70) | LAY (n = 70) |
| Education | Lack of interest in nutrition | 4.44 | 4.55 _a | 4.35 _b | 4.48 _a | 4.40 _a | 4.46 _a | 4.11 | 4.49 _a | 4.49 _a | 4.40 _a | 4.49 _a |
| | Lack of nutrition information | | | | | | | | | | | |
| | Lack of education | | | | | | | | | | | |
| | Not knowing how to make dietary changes | | | | | | | | | | | |
| Resources | Poverty or low income | 3.76 | 4.04 _a | 3.55 _b | 3.93 _{ab} | 3.80 _{ab} | 3.73 _{abc} | 3.41 _c | 3.68 _{abc} | 3.82 _{abc} | 3.67 _{ac} | 3.88 _a |
| | Lack of transportation | | | | | | | | | | | |
| | Lack of time to prepare balanced meals | | | | | | | | | | | |
| | Unavailability of high-quality, healthy foods in local stores | | | | | | | | | | | |
| Willingness to change | Unwillingness to make the necessary changes to improve diet and health | 4.23 | 4.29 | 4.21 | 4.33 _a | 4.29 _a | 4.27 _{ab} | 4.01 _b | 4.28 _{ab} | 4.18 _{ab} | 4.16 _{ab} | 4.21 _{ab} |
| | Traditional food preferences or methods of preparation | | | | | | | | | | | |
| | Lack of time to prepare balanced meals | | | | | | | | | | | |
| | | | | | | | | | | | | |

Factor ratings are means of ratings for items loading on each factor, using a 5-point scale: 1 = not at all important, 5 = very important.

Means in the same row and category (race/ethnicity or sector) with different subscripts differ at $p < .05$.

AA = African American; CAU = Caucasian; HEAL = health; GOVT = government; EDUC = education; BUS = business; REL = religion; VOL = voluntary and private organizations; ICL = informal community leadership; LAY = lay representation.

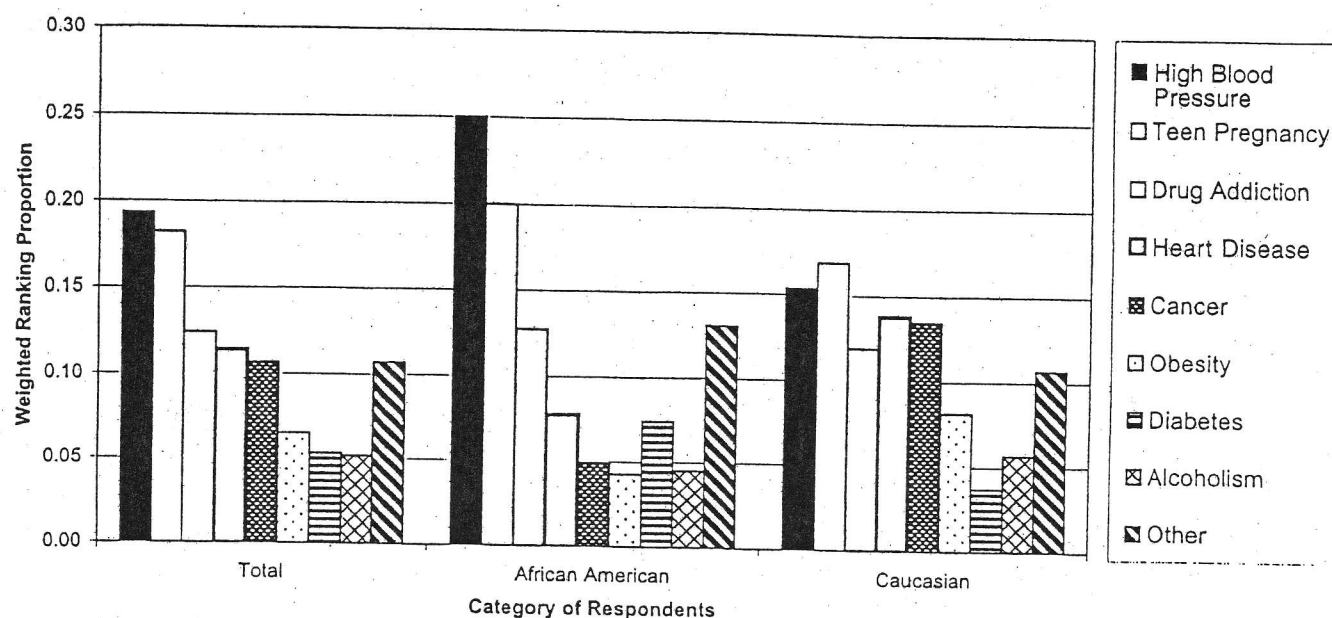


Figure 1. Key informants' ranking of health problems in their Lower Mississippi Delta counties. Informants ranked three health problems from a list of 13 as first, second, or third in importance in their counties. A weighted ranking proportion was computed for each health problem by category of respondent. Three points were assigned for each first, two for each second, and one for each third choice; points were summed and divided by total possible points for the category. Total possible points for category were calculated by multiplying the number of respondents in a category by six points.

tor, labeled health care access, received a rating of 3.72 on a 5-point scale and included seven items, such as "doctors and clinics are not nearby" and "people don't have enough money to buy medicine." African-American key informants rated health care access of greater importance in contributing to health problems than Caucasians (4.05 vs. 3.48, $p = .0001$). There were differences among sectors in their rating of health care access, with lay representatives rating this factor

higher than key informants from the government, education, and business sectors (3.95 vs. 3.44, 3.52 and 3.53, respectively, $p \leq .02$).

The second factor identified as contributing to health problems, labeled health behaviors and rated 4.59, included six items (see Table 6). This factor was characterized by items such as "people do not get enough exercise" and "people make poor food choices." Five of six items loading on this factor were rated as somewhat or very important by over 90% of key informants. Although there was a statistically significant difference by race on rating of importance of health behaviors, the actual difference was small (4.65 for African Americans vs. 4.55 for Caucasians, $p = .032$). There were a number of differences among sectors on their rating of the importance of health behaviors as a contributor to health problems, with the largest being between the health and business sectors (4.70 vs. 4.41, $p = .006$). Key informants from Mississippi rated health behaviors higher than those from Arkansas, but the practical difference was small (4.65 vs. 4.52, $p = .045$).

Key informants rated health behaviors as more important than health care access (4.59 vs. 3.72, $p = .0001$). Both racial/ethnic groups and all sectors also rated the two factors in this order of importance.

Key informants identified a number of resources as available in their counties to address health problems (Table 7). Generally, the programs and services identified by a high percentage of key informants were those typically provided by local health departments, such as prenatal clinics, family

Table 5. Percentage of key informants identifying nutrition programs and services in their Lower Mississippi Delta counties, 1997.

| Program | % |
|-----------------------------------|------|
| Food Stamps | 99.8 |
| School lunch | 98.6 |
| Summer feeding | 70.2 |
| Head Start | 98.6 |
| WIC | 94.3 |
| Elderly feeding | 90.2 |
| Commodity food | 65.3 |
| Food banks/pantries | 62.0 |
| Cooperative Extension/EFNEP | 75.7 |
| Other health department sponsored | 60.4 |
| Other community center sponsored | 48.4 |
| Hospital/clinic sponsored | 49.2 |

WIC = Special Supplemental Nutrition Program for Women, Infants and Children; EFNEP = Expanded Food and Nutrition Education Program.

Table 6. Mean ratings for health problem contributing factors and contributors assigned to each factor, key informant survey, Lower Mississippi Delta counties, 1997.

| Factors | Contributors to Health Problems | total (n = 490) | Race/Ethnicity | | Sector | | | | | | | |
|--------------------|--|--------------------|-------------------|-------------------|--------------------|--------------------|--------------------|---------------------|---------------------|----------------------|--------------------|----------------------|
| | | | AA (n = 200) | CAU (n = 279) | HEAL (n = 70) | GOVT (n = 70) | EDUC (n = 70) | BUS (n = 35) | REL (n = 70) | VOL (n = 35) | ICL (n = 70) | LAY (n = 70) |
| Health care access | Doctors and clinics are not nearby. The quality of health care is poor. People do not have enough money to buy medicine. People lack transportation to the doctor's office or clinic. It is difficult for pregnant women to get health care. Children have not received all the necessary shots. Many people have inadequate health insurance. | 3.72 | 4.05 _a | 3.48 _b | 3.85 _{ae} | 3.44 _{bd} | 3.52 _{bc} | 3.53 _{acd} | 3.76 _{acf} | 3.78 _{abcg} | 3.83 _{ah} | 3.95 _{efgh} |
| Health behaviors | People lack knowledge about good health habits. People do not believe that making changes will improve health. People make poor food choices. People do not get enough exercise. People have unhealthy cooking habits. Many people have inadequate health insurance | 4.59 | 4.65 _a | 4.55 _b | 4.70 _a | 4.59 _{ab} | 4.62 _{ac} | 4.41 _{bd} | 4.64 _a | 4.59 _{ad} | 4.59 _{ad} | 4.48 _{bcd} |

Factor ratings are means of ratings for items loading on each factor, using a 5-point scale: 1 = not at all important, 5 = very important.

Means in the same row and category (race/ethnicity or sector) with different subscripts differ at $p < .05$.

AA = African American; CAU = Caucasian; HEAL = health; GOVT = government; EDUC = education; BUS = business; REL = religion; VOL = voluntary and private organizations; ICL = informal community leadership; LAY = lay representation.

Table 7. Percentage of key informants identifying health programs and services in their Lower Mississippi Delta counties, 1997.

| Program | % |
|--|------|
| Cooperative Extension Service programs | 84.5 |
| Mobile screening for diabetes/hypertension | 50.6 |
| Antismoking campaigns | 38.2 |
| Health fairs | 74.7 |
| Exercise | 51.2 |
| Programs sponsored by private organizations such as the American Cancer Society | 53.7 |
| Prenatal clinics | 71.2 |
| Family planning clinics | 70.8 |
| Other private hospitals/clinics | 59.2 |
| Health department clinics | 64.9 |
| Other community health clinics | 45.1 |

planning clinics, and other health department clinics. Cooperative Extension Service programs were identified by 84.5% of key informants as occurring in their counties and health fairs by 75% of key informants.

DISCUSSION

To be successful, community-based nutrition interventions must consider the priorities and problems perceived by community members and build on available community resources and assets to address those problems. The purpose of this study was to identify community key informants' perceptions of the nutrition and health problems and resources in their LMD counties as a basis for intervention planning.

In this study, the perceived food and nutrition problems clustered into two primary explanatory factors, identified as food access and food choices, with three broad factors, education, willingness to change, and resources, identified as contributing to these problems. Respondents rated food choices as more important than food access. In the analysis, items associated with food choices included frequent consumption of high-fat and fast foods. These findings are generally consistent with food consumption trends noted in the U.S. as a whole.^{28,29}

Blaylock et al. and others³⁰⁻³² have reported that there are a number of factors beyond those at the individual, behavioral level that shape food consumption, including food availability, economic influences such as food prices and pricing of healthy food items, and time and convenience factors. This study indicates that in the rural Mississippi Delta, although the key informants recognized that access to food was a nutrition problem in their counties, they did not consider it to be as important as the issues related to food choices. This finding was unexpected. Food availability has been found to be limited in poor rural areas, where supermarket density is low and travel distances to reach a supermarket are greater than in urban areas in nonpoor rural America.³³ In the same 36-county LMD area where the key informant interviews were con-

ducted, Kaufman identified important problems with food accessibility. He reported that about 70% of low-income households had inadequate access to large grocery stores.³⁴ It is possible that nutrition assistance programs, noted by a high percentage of key informants as present in their counties, may have been effectively addressing needs related to food access in these high-poverty counties at the time this survey was conducted. The single community-level factor identified as a contributor to nutrition problems was resources, where lack of high-quality, healthy food in local stores and lack of transportation were cited.

Key informants identified hypertension as the most important health problem in their counties. This finding is consistent with data on the high prevalence of hypertension in the LMD. Prevalence of self-reported high blood pressure in the 36 Delta NRI counties was 28.9% using combined 1991 and 1993 data.¹³ In 1997, the prevalences of self-reported high blood pressure were 26.3%, 25.1%, and 34.4% for Arkansas, Louisiana, and Mississippi, respectively, compared with a median prevalence of 23.0% for all states.³⁵ The omission of obesity among the highest ranked health conditions is noteworthy. Reported prevalences of overweight adults in 1997 were 52.5%, 55.8%, and 57.8% for Arkansas, Louisiana, and Mississippi, respectively, compared with a median of 53.6% for the U.S.³⁵ From an intervention standpoint, these findings suggest that interventions targeting hypertension coincide with a perceived threat by a high proportion of the respondents.³⁶ On the other hand, the omission of obesity as a highly rated health problem suggests that obesity is not viewed as a primary and threatening disease. This may be due to the perception of obesity as a risk factor rather than as a disease or to tolerant cultural attitudes toward obesity.^{37,38} An intervention focusing on obesity would have to address lack of awareness of the importance of the problem.

Contributors to health problems clustered under two areas, health behaviors and health care access, with health behaviors perceived as more important by key informants. Much emphasis has been placed on the role of individual health and lifestyle behaviors in preventing disease and promoting health.³⁹ Consistent with this emphasis, key informants in the LMD counties perceived that individual behaviors of local residents play an important role in the health conditions afflicting the region. Whereas key informants rated overall health care access as less important than health behaviors, it is noteworthy that African Americans rated it higher than whites. Others have identified lack of access to health care as an important problem in rural areas and among low-income, minority populations.^{40,41} This is especially true in the LMD, where evaluation of health care resources in the three states and the 127-county Delta region defined by the Lower Mississippi Delta Regional Commission noted a deficit of health care providers, with 33 of the 36 LMD counties designated as primary care health professional shortage areas.⁴²

Differences between African Americans and whites have been noted in beliefs about the etiology of disease⁴³ and about the role of individual dietary and health behaviors in disease.^{37,38} In this assessment of perceptions of food and nutri-

tion and health problems and contributors to problems in the LMD, five of seven factors were rated higher in importance by African-American key informants than by whites. The difference in ratings by race/ethnicity was of greater magnitude for factors related to the environment (food access, health care access, resources) than for factors related to individual characteristics and behavior (e.g., food choices, health behaviors). There is ample evidence that minority populations have been more likely to report lack of access to health care than whites.^{40,41} A higher prevalence of food insecurity has also been found in minority populations.⁴⁴ The lesser magnitude of differences in ratings on the individually and behaviorally oriented factors may have been an artifact of the failure of some items loading on these factors to discriminate adequately among respondents. Many of these items were rated as somewhat or very important by most key informants.

Some research suggests that minority and rural populations may view chronic illness as a condition to be accepted rather than as amenable to intervention.⁴⁵ However, health behaviors were perceived by the key informants as an important contributor to health problems, suggesting that this belief was not typical of key informants of either race in this study.

An alternative explanation for the ethnic differences in responses to study questions on nutrition and health problems and contributors is a methodologic one. Previous studies have found systematic differences in the way members of varying racial/ethnic groups respond to questionnaires and scales. Race/ethnicity has been found to be associated with response patterns on Likert response scales, with African Americans more likely to have acquiescent response styles.⁴⁶⁻⁴⁸ Further research is needed to determine factors underlying differences in key informant perceptions regarding specific nutrition and health problems and contributors to problems. Consideration must be given to the implications of these findings for nutrition intervention planning.

The usefulness of key informant interview methodology to assess community health and nutrition needs internationally is well documented.^{18,19,49,50} Key informants in this study represented a wide range of both formal and informal leadership roles in their communities, thus contributing a broad and diverse perspective on community needs. However, we recognize that they do not represent the totality of individual or organizational perspectives in the communities studied. Their responses may have reflected particular biases or interests associated with their role in the community. In this study, key informants welcomed the opportunity to share their perceptions of needs in their local communities. Ongoing contact is being maintained with key informants to help ensure their involvement with interventions planned as part of the Delta NRI.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Key informants were, for the most part, in agreement regarding nutrition and health problems in their communities. They saw multiple factors as contributing to the problems but rated

individual-level factors (food choices, education, willingness to change, health behavior) as more important than community-level factors (food and health care access, resources). The multiplicity of factors suggests that intervention may be required at the individual, household, institutional, and policy levels.^{32,51-53} These data also suggest that nutrition interventions in the LMD may need to build on areas of agreement, while simultaneously reaching groups in the population with differing perceptions of the problems and therefore possible differing perceptions of the solutions.

ACKNOWLEDGMENTS

The authors acknowledge the assistance of Dr. Frankie Schwenk, Dr. Juneal Smith (deceased), Arlyn Pittler, Dr. Dan Hoyt, Dr. Rafida Idris, Dr. Ruth Patrick, and Dr. Laura McCormick in protocol development; Dr. Mary Jane Slesinski for study management; and Dr. J. T. Johnson and Dr. Jonas Ellenberg for statistical consultation.

REFERENCES

1. Haglund B, Weisbrod RR, Bracht N. Assessing the community: its services, needs, leadership, and readiness. In: Bracht N, ed. *Health promotion at the community level*. Newbury Park, CA: Sage, 1990: 91-108.
2. Rose D, Nestle M. Welfare reform and nutrition education: alternative strategies to address the challenges of the future. *J Nutr Educ* 1996;29:61-6.
3. Splett P. Creating the future through planning. In: Owen AL, Splett PL, Owen GM, eds. *Nutrition in the community: The art and science of delivering services*. Boston: WCB McGraw-Hill, 1999:379-403.
4. St. Lawrence J, Ndiaye S. Prevention research in rural communities: overview and concluding comments. *Am J Community Psychol* 1997;25:545-62.
5. Thornton A. Demographic, social, and economic characteristics. In: Lower Mississippi Delta Nutrition Intervention Research Consortium, Harrison G, ed. *Nutrition and health status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: a review of existing data*. Rockville, MD: Westat, 1997:9-23.
6. Pamuk E, Maduc D, Heck H, Reuben C, Lochner K. Socioeconomic status and health chartbook. Health, United States, 1998. Hyattsville, MD: National Center for Health Statistics, 1998.
7. McGee B, Fomby B. Health and nutritional status of pregnant women. In: Lower Mississippi Delta Nutrition Intervention Research Consortium, Harrison G, ed. *Nutrition and health status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: a review of existing data*. Rockville, MD: Westat, 1997:59-70.
8. Bogle ML, Smith J, Scholle S. Health and nutritional status of infants, children, and adolescents. In: Lower Mississippi Delta Nutrition Intervention Research Consortium, Harrison G, ed. *Nutrition and health status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: a review of existing data*. Rockville, MD: Westat, 1997:71-87.
9. Yadrick K, Harris E, Idris R. Food and nutrient intake of Lower Mississippi Delta residents. In: Lower Mississippi Delta Nutrition Intervention Research Consortium, Harrison G, ed. *Nutrition and Health*

- Status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: a review of existing data. Rockville, MD: Westat, 1997:167-194.
10. Morgan Quitno Press. Health care state rankings 1999. Lawrence, KS: Morgan Quitno, 1999.
11. U.S. Department of Commerce, Bureau of the Census. Current population reports: education attainment in the United States. 1995. Washington, DC: U.S. Department of Commerce, Bureau of the Census, 1995.
12. Deseran FA, Singelmann J. Poverty and deprivation in the Mississippi Delta: implications of sociological research for social development in an industrial country. *Int J Contemp Sociol* 1993;30:81-101.
13. Smith J, Lensing S, Horton JA, et al. Prevalence of self-reported nutrition-related health problems in the Lower Mississippi Delta. *Am J Public Health* 1999;89:1418-21.
14. Warheit GJ, Bell RA, Schwab JJ. Selecting the needs assessment approach. In: Cox F, Erlich JL, Rothman J, Tropman JE, eds. *Tactics and techniques of community practice*. Itasca, IL: EE. Peacock, Inc., 1984:41-59.
15. Gilchrist VJ. Key informant interviews. In: Crabtree BF, Miller WL, eds. *Doing qualitative research*. Newbury Park, CA: Sage, 1992:70-89.
16. Lengeler C, Mshinda H, de Savigny D, Kilima P, Morona D, Tanner M. The value of questionnaires aimed at key informants, and distributed through an existing administrative system, for rapid and cost-effective health assessment. *World Health Stat Q* 1991;44:150-9.
17. Lillie-Blanton M, Hoffman SC. Conducting an assessment of health needs and resources in a racial/ethnic minority community. *Heath Serv Res* 1995;30:225-36.
18. Afonja SA. Rapid assessment methodologies: application to health and nutrition programmes in Africa. In: Scrimshaw NS, Gleason GR, eds. *Rapid assessment procedures: qualitative evaluation methodologies for planning and evaluation of health related programmes*. Boston: International Nutrition Foundation for Developing Countries, 1992: 81-94.
19. Berggren G, Mtimuni B. Use of rapid assessment procedures for nutrition programme planning, project reorientation, and training in Malawi. In: Scrimshaw NS, Gleason GR, eds. *Rapid assessment procedures: qualitative methodologies for planning and evaluation of health related programmes*. Boston: International Nutrition Foundation for Developing Countries, 1992:433-46.
20. Harsha D, Thornton A. Health status of adults. In: Lower Mississippi Delta Nutrition Intervention Research Consortium, Harrison G, ed. *Nutrition and health status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: a review of existing data*. Rockville, MD: Westat, 1997:89-108.
21. Smith J, Scholle S. Food and nutrition programs and resources. In: Lower Mississippi Delta Nutrition Intervention Research Consortium, Harrison G, ed. *Nutrition and health status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: a review of existing data*. Rockville, MD: Westat, 1997:121-41.
22. Morgan DL. Practical strategies for combining qualitative and quantitative methods: applications to health research. *Qual Health Res* 1998;8:362-76.
23. Pederson D. Qualitative and quantitative: two styles of viewing the world or two categories of reality? In: Scrimshaw NS, Gleason GR, eds. *Rapid assessment procedures: qualitative evaluation methodologies for planning and evaluation of health related programmes*. Boston: International Nutrition Foundation for Developing Countries, 1992:38-59.
24. Steckler A, McLeroy KR, Goodman RM, Bird ST, McCormick L. Toward integrating qualitative and quantitative methods: an introduction. *Health Educ Q* 1992;19:1-8.
25. Johnson SC. *Selecting ethnographic informants*. Newbury Park, CA: Sage, 1990.
26. SAS Institute I. *SAS System version 6.12*. Cary, NC: SAS Institute, 1997.
27. SPSS 10.0 for Windows. Chicago: SPSS, Inc, 1999.
28. Daily dietary fat and total food-energy intakes—Third National Health and Nutrition Examination Survey, Phase 1, 1988-91. *MMWR Morb Mortal Wkly Rep* 1994;43:116-23.
29. Lin B-H, Guthrie J, Frazao E. Nutrient contribution of food away from home. In: Frazao E, ed. *America's eating habits: changes and consequences*. Agriculture Information Bulletin No. 750. Washington, DC: U.S. Department of Agriculture, Economic Research Service, Food and Rural Economics Division, 1999:213-42.
30. Blaylock J, Smallwood D, Kassel K, Variyam J, Aldrich L. Economics, food choices, and nutrition. *Food Policy* 1999;24:269-86.
31. Huang K. Role of national income and prices. In: Frazao E, ed. *America's eating habits: changes and consequences*. Agriculture Information Bulletin No. 750. U.S. Department of Agriculture, Economic Research Service, Food and Rural Economics Division, 1999:161-71.
32. Nestle M, Wing R, Birch L, et al. Behavioral and social influences on food choice. *Nutr Rev* 1998;56(II):S50-74.
33. Morris PM, Neuhauser L, Campbell C. Food security in rural America: a study of the availability and cost of food. *J Nutr Educ* 1992;24:52S-8S.
34. Kaufman PR. Rural poor have less access to supermarkets, large grocery stores. *Rural Dev Perspect* 1999;13:19-26.
35. State- and sex-specific prevalence of selected characteristics—Behavioral Risk Factor Surveillance System, 1996 and 1997. In: CDC Surveillance Summaries, July 7, 2000. *MMWR* 2000;49(SS06):1-39.
36. Strecher VJ, Rosenstock IM. The Health Belief Model. In: Glanz K, Lewis FM, Rimer BK, eds. *Health behavior and health education: theory, research and practice*. 2nd Ed. San Francisco: Jossey-Bass, 1997:41-59.
37. Kumanyika SK, Morsink C, Agurs T. Models of dietary and weight change in African-American women: identifying cultural components. *Ethn Dis* 1992;2:166-75.
38. Stevens J, Kumanyika SK, Keil JE. Attitudes toward body size and dieting: differences between elderly black women and white women. *Am J Public Health* 1994;84:1322-5.
39. Porter D, Kris-Etherton P, Borra S, et al. Educating consumers regarding choices for fat reduction. *Nutr Rev* 1998;56(II):S75-100.
40. Swanson GM, Ward AJ. Recruiting minorities into clinical trials: toward a participant-friendly system. *J Natl Cancer Inst* 1995;87:1747-59.
41. U.S. Department of Health and Human Services. *Healthy People 2010*, January 2000. <http://www.health.gov/healthypeople/Document/HTML/Volume1/goal.htm>. Accessed Sept 7, 2000.
42. Kirby RS. The geography of health care resources and services in the Lower Mississippi Delta. In: Lower Mississippi Delta Nutrition Intervention Research Consortium, Harrison G, ed. *Nutrition and health status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: a review of existing data*. Rockville, MD: Westat, 1997:33-57.
43. Schnittker J, Freese J, Powell B. Nature, nurture, neither, nor: black-white differences in beliefs about the causes and appropriate treatment of mental illness. *Soc Forces* 2000;78:1101.
44. Andrews M, Nord M, Bickel G, Carlson S. Household food security in the United States, 1999. Food and Rural Economics Division, Eco-

- conomic Research Service, U.S. Department of Agriculture. Food Assistance and Nutrition Research Report No. 8. Washington, DC: U.S. Department of Agriculture, 2000.
45. Groce NE, Zola IK. Multiculturalism, chronic illness, and disability. *Pediatrics* 1993;91:1048-55.
 46. Warnecke RB, Johnson TP, Chavez N, et al. Improving question wording in surveys of culturally diverse populations. *Ann Epidemiol* 1997;7:334-42.
 47. Ware JE. Effects of acquiescent response set on patient satisfaction ratings. *Med Care* 1978;16:327-36.
 48. Bachman JG, O'Malley PM. Yea-saying, nay-saying, and going to extremes: black-white differences in response styles. *Public Opinion Q* 1984;48:491-509.
 49. Wahlqvist ML, Kouris A, Gracey M, Sullivan H. An anthropological approach to the study of food and health in an indigenous population. *Food Nutr Bull* 1991;13:145-9.
 50. Brown WJ, Redman S. Setting targets: a three stage model for determining priorities for health promotion. *Aust J Public Health* 1995;19:263-9.
 51. Contento I, Balch GI, Bronner YL, et al. The effectiveness of nutrition education and implications for nutrition education policy, programs, and research: a review of research. *J Nutr Educ* 1995;27:279-83, 287-90.
 52. Baranowski T. Psychological and sociocultural factors that influence nutritional behaviors and interventions: cardiovascular disease. In: Garza C, Haas JD, Habicht J-P, Pelletier DL, eds. *Beyond nutritional recommendations: implementing science for healthier populations. Proceedings from the 14th Annual Bristol-Myers Squibb/Mead Johnson Nutrition Research Symposium*. Washington, DC, 1995. Ithaca, NY: Cornell University Division of Nutritional Sciences, 1996: 164-78.
 53. Glanz K, Lewis FM, Rimer BK. *Health education and health behavior, theory, research, and practice*. 2nd Ed. San Francisco: Jossey-Bass, 1997.